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Orbit of the Spectroscopic Binary 125 Tauri

BY

J. B. CANNON, M.A.

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ORBIT OF THE SPECTROSCOPIC BINARY 125 TAURI

BY J. B. CANNON, M.A.

This star ($\alpha = 5^h\ 34^m$, $\delta = +25°\ 50'$) was announced a binary by O. J. Lee (*Astrophysical Journal*, January, 1914) from the measures of 3 plates (Table II) giving a range of 62 km. The type is B3, the lines being, on the whole, rather poor. Table I gives the lines measured with the wavelengths and the elements to which they are due.

TABLE I

LINES MEASURED

λ	Element	λ	Element
4481·400	*Mg*	4101·890	*H*
4471·676	*He*	4026·352	*He*
4388·100	*He*	3970·177	*H*
4340·634	*H*	3933·825	*Ca*
4267·301	*Fe*		

TABLE II

LEE'S OBSERVATIONS

Date	Julian Day	Phase	Velocity	O–C
1911				
Dec. 3	2,419,374·748	17·701	+13	+10·6
1912				
Dec. 10	747·733	0·590	+63	+10·2
Dec. 30	767·656	20·513	+ 1	− 1·4

The determination of the elements of the orbit is based on the measures of 79 plates (Tables III and IV). These 79 plates were grouped into 14 normal places (Table V), and the best curve possible drawn through these.

TABLE III

OTTAWA OBSERVATIONS

Plate	Observer*	Date	Exposure	Julian Day	Phase	Vel.	Wt.	O-C
		1914	m.					
6608	H	Dec. 6	60	2,420,473·861	2·254	+43·6	3	+ 5·1
6618	P¹	" 11	65	478·783	7·266	+20·9	2	+ 6·5
6630	H	" 15	66	482·785	11·178	+ 7·6	1	+ 0·6
6640	P¹	" 16	70	483·830	12·223	+13·1	1	+ 7·3
6644	Y	" 17	60	484·764	13·157	+ 8·7	2	+ 3·7
6669	Y	" 30	65	497·682	26·375	+20·3	4	− 6·3
		1915						
6681	C	Jan. 4	65	502·800	3·329	+25·3	2	− 5·2
6687	Y	" 5	75	503·696	4·225	+22·6	4	− 2·4
6694	C–P¹	" 8	65	506·737	7·266	+25·1	3	+10·5
6703	Y	" 10	60	508·634	9·163	+21·6	4	+11·4
6709	Y	" 12	82	510·659	11·188	+ 7·7	4	+ 0·7
6721	C	" 20	85	518·668	19·197	+13·4	3	+11·4
6735	C–P¹	" 25	70	523·701	24·230	+ 6·8	1	− 1·4
6743	P¹	" 27	60	525·639	26·168	+25·4	2	+ 1·0
6749	H	" 28	80	526·665	27·194	+27·6	4	−11·6
6759	C	" 29	85	527·692	28·221	+44·0	2	− 8·8
6767	C	Feb. 3	60	532·649	5·314	+24·3	3	+ 3·8
6784	C	" 12	80	541·694	14·359	− 0·4	1	− 4·4
6789	H	" 17	64	546·644	19·309	− 2·0	2	− 4·0
6797	H	" 18	60	547·570	20·235	− 3·1	3	− 5·3
6807	C	" 19	55	548·616	21·281	+ 3·9	1	+ 1·1
6813	Y	" 21	55	550·542	23·207	+23·3	2	+17·9
6828	H	Mar. 3	55	560·604	5·505	+ 7·9	2	−12·1
6836	H	" 4	60	561·596	6·397	+ 4·1	1	−12·7
6843	Y	" 7	60	564·528	9·329	+17·4	2	+ 7·4
6860	P	" 13	70	570·667	15·568	+ 5·8	2	+ 2·4
6869	H	" 15	59	572·600	17·501	− 2·4	3	− 4·8
6875	H	" 18	46	575·584	20·385	+11·1	3	+ 8·7
6880	Y	" 19	60	576·601	21·402	+15·3	2	+12·3
6890	H	" 24	57	581·515	26·316	+10·3	3	−15·2
6913	H	April 8	57	596·584	13·521	+ 6·5	2	+ 2·7
6920	Y	" 13	56	601·578	18·515	− 5·5	2	− 7·5
7248	H	Sept. 14	47	755·908	5·661	+11·4	2	− 7·6
7263	P¹¹	" 17	60	758·816	8·569	+13·6	1	+ 2·2
7279	H	" 21	63	762·853	12·606	+10·3	3	+ 5·0
7287	C	" 22	75	763·852	13·605	− 0·2	1	− 4·8
7298	H	" 28	63	769·832	19·585	+ 1·4	3	− 0·8
7307	C	" 29	58	770·896	20·649	− 6·4	3	− 8·8
7335	C	Oct. 11	80	782·753	4·642	+13·8	1	− 9·4
7339	H	" 12	65	783·928	5·817	+30·6	2	+12·0
7346	C	" 15	71	786·868	8·757	+21·3	2	+ 9·9
7363	Y	" 24	70	795·840	17·729	+ 4·3	2	+ 1·9
7367	H	" 26	60	797·799	19·688	+ 0·9	1	− 1·3

TABLE III

OTTAWA OBSERVATIONS—*Concluded*

Plate	Observer*	Date	Exposure	Julian Day	Phase	Vel.	Wt.	O–C
		1915	m.					
7382	C	Nov. 6	60	2,420,808·729	2·754	+22·8	1	−20·2
7389	C	" 7	65	809·686	3·709	+20·3	2	− 7·7
7390	C	" 7	60	809·729	3·754	+28·9	1	− 0·1
7402	H	" 12	75	814·794	9·834	+23·5	2	+14·5
7407	Y	" 13	60	815·809	10·849	+ 9·7	2	+ 2·1
7416	C	" 17	80	819·669	13·694	− 0·4	2	− 5·0
7432	H	" 25	70	827·635	21·660	+23·1	2	+20·0
7442	C	Dec. 3	60	835·712	1·873	+39·5	3	− 2·7
7443	C	" 3	64	835·759	1·920	+46·2	3	+ 4·0
7445	C	" 3	65	835·869	2·030	+32·4	1	− 9·0
7459	H	" 28	58	860·702	26·863	+36·1	2	+ 1·6
7460	H	" 28	65	860·744	26·905	+33·0	2	− 1·5
7462	C	" 29	60	861·760	27·921	+53·2	3	+ 2·4
7463	C	" 29	50	861·799	27·960	+52·7	4	+ 1·9
7464	H	" 30	60	862·541	28·702	+49·6	3	− 2·2
7465	H	" 30	60	862·583	28·744	+52·0	2	+ 0·2
		1916						
7470	C	Jan. 3	70	866·576	4·873	+16·5	2	− 5·5
7471	C	" 3	60	866·622	4·919	+15·8	1	− 6·2
7476	C	" 7	60	870·562	8·359	+ 9·9	2	− 1·0
7477	C	" 7	60	870·604	8·901	+ 9·2	1	− 1·7
7490	C	" 19	60	882·559	20·856	− 0·3	1	− 2·7
7495	Y–C	" 28	60	891·620	2·053	+36·2	3	− 4·8
7496	C	" 28	67	891·669	2·102	+26·4	4	−14·6
7509	P	Feb. 19	58	913·522	23·955	+12·3	4	+ 4·8
7511	Y	" 20	70	914·501	24·934	+22·9	4	+10·9
7514	Y	" 20	64	914·644	25·077	+22·0	3	+ 9·0
7515	H	" 21	124	915·528	25·961	+ 8·2	3	−13·2
7516	C	" 23	60	917·500	27·933	+48·7	4	− 2·1
7545	H	Mar. 16	165	939·547	22·116	+15·7	4	+12·3
7547	Y	" 17	60	940·503	23·072	− 1·8	3	− 7·0
7556	Y	" 19	60	942·507	25·076	+12·3	3	− 0·7
7564	Y	" 21	38	944·593	27·162	+39·8	2	+15·8
7570	H	" 23	60	946·573	29·142	+44·6	2	− 4·2
7609	P	April 12	24	966·547	21·252	+12·3	3	+ 9·3
7614	H	" 13	60	967·594	22·299	+10·7	2	+ 6·8
7616	P	" 19	74	973·547	28·252	+64·9	4	+11·9

*P=Plaskett, J. S.; H=Harper; Y=Young; P[1]=Parker; P[11]=Plaskett, H. H.; C=Cannon

TABLE IV

MEASURES OF 125 TAURI

λ	6608		6618		6630		6640		6644		6669		6681	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4481·400	+48·45	¼	+21·28	¼			+26·54	¼	+16·53	¼	+31·42	½	+43·07	¼
4471·676	+39·81	¼	+19·41	¼			+ 8·33	¼	+ 2·36	½	+23·64	¼	+22·89	¼
4340·634	+39·92	½	+20·36	½	+ 8·60	½	+10·52	½	− 2·26	½	+41·28	¼		
4267·301									+24·27	¼			+42·65	¼
4101·890	+44·13	½	+13·62	¼	+ 2·05	¼			+18·66	¼	+31·07	½	+35·27	¼
4026·352											+34·44	¼		
3970·177	+33·40	¼									+19·77	¼		
3933·825	+31·64	½			+12·30	¾					+19·33	½		
Weighted mean	+39·23		+19·00		+ 7·88		+13·97		+ 9·93		+28·28		+35·98	
Va	+ 4·87		+ 2·30		+ 0·19		− ·36		− ·85		− 7·60		−10·19	
Vd	− ·20		− ·11		− ·14		− ·20		− ·08		− ·06		− ·23	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	+43·6		+20·9		+ 7·6		+13·1		+ 8·7		+20·3		+25·3	

MEASURES OF 125 TAURI—*Continued*

λ	6687		6694		6703		6709		6721		6735		6743	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4481·400	+11·61	¾	+40·90	¼	+37·43	¼	+ 7·01	½	+40·06	¼	.....	.....	+41·70	¼
4471·676	.....	.....	.....	.....	+11·44	¼	+21·15	½	.....	.....	.....	.....	.....	.....
4388·100	+44·85	¼	.....	.....	+47·78	¼	.....	.....	.....	.....	.....	.....	+63·95	¼
4340·634	+29·07	½	+32·80	¼	+35·85	½	+13·57	½	+23·68	½	+21·50	½	+30·88	½
4267·301	+45·75	¼	+15·39	¼	+16·68	¼	.....	.....	+51·21	¼	.....	.....	.....	.....
4101·890	+40·49	½	+43·48	¼	+35·92	½	+45·81	½	+34·71	¼	+37·50	½	+63·20	¼
4026·352	+36·80	¼	.....	.....	.....	.....	+12·82	½	.....	.....	+16·56	¼	.....	.....
3970·177	.....	.....	+38·21	¼	+39·61	¼	.....	.....	+34·78	¼	.....	.....	.....	.....
3933·825	+24·13	¼	+46·50	½	+42·03	½	+26·69	½	+11·51	¼	.....	.....	.....	.....
Weighted mean	+33·48		+37·69		+34·60		+21·99		+31·38		+26·91		+46·12	
V_0	−10·60		−12·12		−13·04		−13·99		−17·55		−19·71		−20·39	
V_2	− ·04		− ·16		± ·00		− ·04		− ·11		− ·17		− ·09	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	+22·6		+25·1		+21·6		+ 7·7		+13·4		+ 6·8		+25·4	

MEASURES OF 125 TAURI—*Continued*

λ	6749		6759		6767		6784		6789		6797		6807	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4481·400	+60·72	¼			+64·57	¼			+24·58	¼	+20·68	¼		
4471·676	+86·90	¼	+67·58	¼	+45·62	¼					+22·12	¼		
4388·100	+67·58	¼												
4340·634	+34·70	½	+52·62	½	+36·00	½	+31·68	½	+19·79	½	+24·41	¼	+26·00	¼
4267·301	+46·90	¼			+50·43	¼					+42·70	¼		
4101·890	+24·51	½	+67·62	¼	+60·70	¼	+ 9·33	¼	+19·85	¼	+12·20	¼	+34·48	½
3970·177			+87·80	¼										
3933·825	+59·40	¼			+40·20	¼	+30·38	¼	+43·18	¼				
Weighted mean	+48·80		+65·64		+47·65		+25·76		+25·42		+24·42		+31·65	
Va	−20·78		−21·17		−22·93		−25·66		−26·93		−27·14		−27·37	
Vd	− ·13		− ·17		− ·12		− ·22		− ·17		− ·08		− ·14	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	+27·6		+44·0		+24·3		− 0·4		− 2·0		− 3·1		+ 3·9	

MEASURES OF 125 TAURI—*Continued*

λ	6813		6828		6836		6843		6860		6869		6875	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4481·400	+36·43	¼	+45·98	¼	+13·89	¼	.....	.....	+50·02	¼	+22·28	¼	+25·42	¼
4471·676	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	+13·06	¼	+57·68	¼
4340·634	+76·40	½	+30·31	½	+44·35	½	+38·49	¼	+26·80	½	+23·72	½	+47·85	½
4267·301	+34·42	¼	.....	.....	.....	.....	.....	.....	+51·82	¼	+28·20	¼	.....	.....
4101·890	+42·40	½	+43·92	¼	.....	.....	+54·20	¼	+25·45	¼	.....	.....	+28·22	¼
4026·352	.....	.....	.....	.....	.....	.....	+47·52	¼	.....	.....	.....	.....	.....	.....
3970·177	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	+49·12	¼
3933·825	.....	.....	.....	.....	+33·21	¼	+49·25	¼	.....	.....	+42·50	½	+45·30	¼
Weighted mean	+51·41		+37·63		+33·95		+47·36		+36·18		+27·99		+41·39	
Va	−27·75		−29·26		−29·37		−29·62		−29·85		−29·88		−29·80	
Vd	− ·04		− ·17		− ·17		− ·08		− ·28		− ·22		− ·21	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	+23·3		+ 7·9		+ 4·1		+17·4		+ 5·8		− 2·4		+11·1	

MEASURES OF 125 TAURI—*Continued*

λ	6880		6890		6913		6920		7248		7263		7279	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4481·400	+49·45	¼	+39·53	¼	+40·18	¼	+16·65	¼	−14·90	¼	−17·45	½	−16·08	¼
4471·676			+42·15	¼			+22·25	¼	−18·56	¼	−25·72	¼	−19·45	¼
4340·634	+52·05	½	+53·75	¼	+29·27	½	+38·25	¼	−20·61	¼	− 3·27	¼	− 1·13	¼
4267·301	+43·80	¼			+38·71	¼	+40·24	¼					−21·38	¼
4101·890			+54·70	¼			+12·32	½					−32·91	½
4026·352													−14·74	¼
3970·177			+20·32	½									−13·15	¼
3933·825	+37·15	¼	+44·68	¼			+20·30	¼						
Weighted mean	+45·61		+40·21		+34·36		+23·19		−18·01		−15·97		−19·07	
Va	−29·77		−29·50		−27·31		−28·20		+29·58		+29·61		+29·54	
Vd	− ·22		− ·13		− ·24		− ·25		+ ·11		+ ·22		+ ·16	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	+15·3		+10·3		+ 6·5		− 5·5		+11·4		+13·6		+10·3	

MEASURES OF 125 TAURI—*Continued*

λ	7287		7298		7307		7335		7339		7346		7363	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4181·400	−69·42	¼	.. ..	..	−35·28	¼	−33·80	¼	−10·96	¼	−28·55	¼	−24·40	½
4471·676	− 3·22	¼	−30·80	¼	.....	..	−13·74	½	+ 8·30	¼	.....	..	+ 8·33	¼
4388·100	.....	..	−23·44	¼										
4340·634	−26·66	¼	−28·12	½	−39·63	½	+ 1·46	¼	−11·49	¼	+ 1·13	¼	−24·88	¼
4267·301	.....	..	.....	...	−36·08	¼	.....	.	+ 6·91	¼	+ 3·19	¼	−31·62	¼
4101·890	−19·11	¼	−23·48	¼	−36·34	¼	− 0·12	¼	+19·30	¼	−22·80	¼	−34·57	¼
4026·352	.....	...	−31·18	¼	−24·00	¼	.....	..	+12·66	¼	+14·04	¼	− 0·96	¼
3933·825	.....	..	.....	...	.....	..	.....	..	.....	..	− 0·32	¼		
Weighted mean	−29·60		−27·52		−35·15		−13·19		+4·12		− 4·60		−18·93	
Va	+29·47		+29·07		+28·96		+27·08		+26·83		+26·17		+23·49	
Vd	+ ·14		+ ·14		+ ·04		+ ·22		− ·08		+ ·02		+ ·03	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	0·2		+ 1·4		+ 6·4		+13·8		+30·6		+21·5		+ 4·3	

MEASURES OF 125 TAURI—(Continued)

λ	7367		7382		7389		7390		7402		7407		7416	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4481·400			−67·80	½	+17·27	¼	+25·15	¼			+ 2·88	¼		
4471·676	−12·12	¼					+ 9·83	½	12·62	¼	+13·68	¼		
4388·100											15·46	¼	− 0·58	¼
4340·634	18·80	½	+28·28	½	− 2·04	½	+19·34	¼	+ 7·54	¼	8·71	½	−24·51	½
4267·301	−39·70	¼			12·18	½			+28·50	¼	− 7·72	¼	− 6·94	¼
4101·890			+14·36	¼	−48·27	¼	12·96	¼	+ 0·93	¼	−19·10	¼	−26·81	¼
3970·177					− 4·79	¼			+11·28	¼			− 7·40	¼
3933·825					+29·22	¼								
Weighted mean	−22·35		+41·30		− 1·60		+10·24		− 7·12		− 6·16		11·79	
V_0	+23·40		−19·40		+18·77		+18·77		+16·64		+16·40		+14·18	
V_0	+ ·09		− ·17		− ·20		+ ·14		+ ·02		·02		+ ·17	
Curv	− ·28		·28		·28		·28		·28		·28		− ·28	
Radial Velocity	+ 0·9		+22·8		+20·3		+28·9		+23·5		+ 9·7		0·4	

MEASURES OF 125 TAURI—*Continued*

λ	7432		7442		7443		7445		7459		7460		7462	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4181·400	.....	..	+25·58	¼	+33·02	¼	.....	....	+69·60	¼	+31·91	¼	+46·41	¼
4171·676	+ 8·70	¼	+19·15	¼	+26·12	¼	+40·02	¼	.....	....	+49·42	¼	+87·50	¼
4388·100	.....	....	+33·93	¼										
4340·634	+ 7·16	¼	+35·61	½	+45·43	½	+23·51	¼	+37·80	½	+48·61	¼	+41·74	½
4267·301	+17·06	½	.....	....	.....	..	+11·97	¼						
4101·890	.....	....	.....	..	+34·21	¼	+29·28	¼	+26·30	¼	+29·26	¼	+67·08	¼
4026·352	.....	....	+48·83	¼	+55·20	¼	.....	....	.....	....	.....	....	+76·82	¼
3970·177	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	+44·30	¼
Weighted mean	+12·50		+33·11		+39·89		+26·19		+42·88		+39·80		+60·64	
V_0	+10·67		+ 6·65		+ 6·65		+ 6·65		− 6·46		− 6·46		− 7·00	
V_d	+ ·20		+ ·06		− ·04		− ·20		− ·04		− ·11		− ·14	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	+23·1		+39·5		+46·2		+32·4		+36·1		+33·0		+53·2	

MEASURES OF 125 TAURI *Continued*

λ	7463		7464		7465		7470		7471		7476		7477	
	Vel	Wt	Vel	Wt	Vel	Wt	Vel	Wt	Vel	Wt	Vel	Wt	Vel	Wt
4181·400	+74·43	¼	+71·80	¼	64·20	¼			15·64	¼	+28·15	¼	11·15	¼
4471·676	+38·90	½	+46·00	¼							3·23	¼		
4340·634	+87·30	½	+66·18	¼	51·70	½	+33·42	½	+32·68	¼	+27·48	¼	2·82	¼
4267·301	+57·50	¼	+41·55	¼			+22·33	½			+23·81	¼		
4101·800	+42·80	¼			70·65	¼	+19·58	¼	+28·08	¼	+24·37	¼	+33·00	½
4026·352	+57·60	¼												
3933·825	+64·42	¼												
Weighted mean	+60·14		+57·13		+59·56		+26·09		+25·47		+21·44		+20·74	
V_0	− 7·00		− 7·41		− 7·41		− 9·47		− 9·47		− 11·40		− 11·40	
V_d	− 20		− 20		− 14		− 41		− 08		− 44		+ 09	
Curv.	− 28		− 28		− 28		− 28		− 28		− 28		− 28	
Radial Velocity	+52·7		+49·6		+52·0		+16·5		+15·8		+9·9		+9·2	

MEASURES OF 125 TAURI—*Continued*

λ	7490		7495		7496		7509		7511		7514		7515	
	Vel.	Wt	Vel.	Wt	Vel	Wt	Vel.	Wt	Vel	Wt	Vel.	Wt	Vel	Wt
4481·400	+17·31	¼	+46·42	¼	+26·18	¼	.....	...	+64·33	½	+54·24	¼	+43·40	¼
4471·676	+34·63	¼	+74·81	¼	+43·40	¼	.....	...	+41·33	¼	+58·62	¼	.....	...
4340·634	+ 0·23	¼	+52·92	½	+63·55	½	+34·72	½	+51·00	½	+37·90	¼	+34·98	½
4267·301	+15·49	¼			+51·40	¼	+42·42	¼	+37·61	¼	.....	...	+27·98	¼
4101·890			+61·30	¼	.....	...	+43·90	¼	+38·02	¼	+53·22	½	+53·16	¼
4026·352			+55·21	¼	+ 10·42	¼	+53·05	¼	.....	...	+18·90	¼		
3970·177					+ 13·46	¼	+32·30	¼	+57·21	¼				
3933·825							+31·62	¼	.....	...	+61·82	½	+30·50	¼
Weighted mean	+16·91		+57·26		+47·41		+39·82		+50·60		+49·97		+36·14	
Va	−17·00		−20·67		−20·67		−27·26		−27·47		−27·47		−27·68	
Vd	+ ·11		− ·06		− ·09		+ ·02		+ ·05		− ·20		+ ·00	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	− 0·3		+36·2		+26·4		+12·3		+22·9		+22·0		+ 8·2	

MEASURES OF 125 TAURI—*Continued*

λ	7516		7545		7547		7556		7564		7570		7609	
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4481·400	.....	...	+37·19	¼	+28·68	¾	+40·96	¼	+72·95	¼	.....	...	+40·15	½
4471·676	+53·11	¼	+36·92	¼	+28·95	¼	+51·42	¼	+69·50	¼	+40·02	¼	+58·30	¼
4340·634	+99·62	¼	+40·82	½	+26·33	½	+37·67	¼	+73·50	½	+84·80	½	+21·94	½
4267·301	+78·66	¼	+59·10	¼	+29·70	¼	+35·70	¼	+60·22	¼	+53·36	¼	+60·22	¼
4101·890	+81·90	¼	+54·20	¼	.....	...	+46·63	¼	.....	...	+109·70	¼	+30·50	¼
4026·352	+57·80	¼	+32·85	¼	+30·85	¼	.....	...	.....	...	.....	...	.....	...
3970·177	+106·50	¼	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...
3933·825	+61·02	¼	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...
Weighted mean	+76·94		+45·99		+28·47		+42·48		+69·94		+74·53		+39·04	
V_0	−27·96		−29·86		−29·84		−29·77		−29·63		−29·49		−26·21	
V_d	+ ·04		− ·14		− ·14		− ·11		− ·23		− ·14		− ·25	
Curv.	− ·28		− ·28		− ·28		− ·28		− ·28		− ·28		− ·28	
Radial Velocity	+48·7		+15·7		− 1·8		+12·3		+39·8		+44·6		+12·3	

MEASURES OF 125 TAURI—*Concluded*

λ	7614		7616											
	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.	Vel.	Wt.
4481·400	.....	...	+105·90	1	.....	...	.....	...	.....	...	.....	...	.....	...
4471·676	+ 36·51	1	+ 92·00	1	.....	...	.....	...	.....	...	.....	...	.....	...
4340·634	+ 34·64	1	+ 96·60	1	.....	...	.....	...	.....	...	.....	...	.....	...
4267·301	+ 48·80	1	+ 88·20	1	.....	...	.....	...	.....	...	.....	...	.....	...
4101·890	+ 31·28	1	+ 53·30	1	.....	...	.....	...	.....	...	.....	...	.....	...
4026·352	.....	...	+ 96·20	1	.....	...	.....	...	.....	...	.....	...	.....	...
Weighted mean	+37·18		+89·83		.....		.....		.....		.....		.....	
V_o	−25·96		−24·36		.....		.....		.....		.....		.....	
V_d	− ·28		− ·27		.....		.....		.....		.....		.....	
Curv.	− ·28		− ·28		.....		.....		.....		.....		.....	
Radial Velocity	+10·7		+64·9		.....		.....		.....		.....		.....	

TABLE V

NORMAL PLACES

No.	Julian Day	Phase	Velocity	Weight	O-C
1	2,420,852·514	1·957	+39·8	1·0	−2·1
2	661·557	3·103	+27·6	2·0	−4·5
3	711·496	5·036	+19·4	1·0	−2·1
4	603·354	6·374	+18·4	1·3	+1·6
5	695·533	9·120	+18·1	1·5	+7·7
6	580·109	11·231	+ 8·9	1·0	+1·7
7	685·444	13·217	+ 6·0	1·0	+1·0
8	624·063	16·619	+ 1·4	1·0	−1·2
9	639·685	19·891	+ 1·8	2·5	−0·3
10	847·908	22·114	+12·8	2·5	+9·2
11	761·936	25·676	+17·4	2·5	−0·8
12	743·874	27·064	+32·8	1·0	−5·4
13	827·528	0·119	+50·2	1·5	−1·4
14	918·193	0·762	+54·7	1·0	+2·4

This curve was determined graphically by successive trials. The elements are :

$$P = 27{\cdot}864 \text{ days}$$
$$e = {\cdot}55$$
$$\omega = 335^\circ$$
$$K = 25{\cdot}5 \text{ km.}$$
$$\gamma = 14{\cdot}8 \text{ km.}$$
$$T = 2{,}420{,}471{\cdot}607 \text{ J.D.}$$
$$a \sin i = 8{,}160{,}000 \text{ km.}$$

It will be seen that the residuals are unusually large and that the form of the curve which would go through, or approximately through, all the normal places would suggest the results of blends. Starting at phase 1 (on curve) it will be seen that the residuals become negative and continue so until about phase 6 days, when they become positive. They remain positive until about phase 14 days.

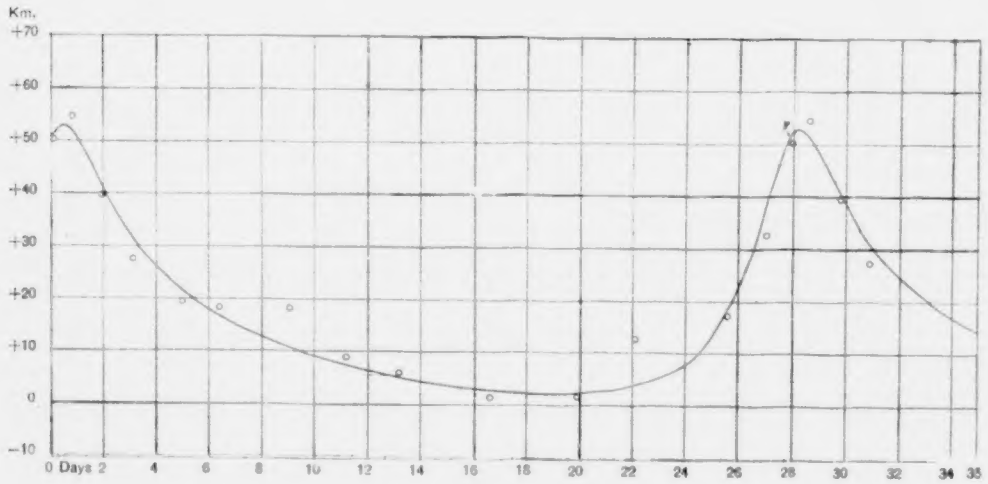
The similar feature is marked in the up-curve. This would be the effect of a blended spectrum caused by the light of the second body of the system if its spectrum were affecting the lines of the spectrum of the primary. It is impossible to say whether the curve given is low enough at the minimum or high enough at the maximum. Although, on some

three or four plates one or two lines show a suspicion of doubling, there are none clearly enough defined to measure, so that there is no possible means of determining the true maximum and minimum. Mr. Lee in his announcement of the three measures referred to above, describes the lines as "simple," although one of his plates is taken at the maximum of the curve.

The lines of the spectrum, although not good at all, should allow of much closer measurement than the residuals indicate, and the blend theory seems the only one that would explain the regular variation of the residuals of the normal places. Similar effects have been found in systems where the secondary has been measurable at the maximum and minimum.

No least-squares solution was applied as any effect the solution might have, could hardly serve to approach nearer the true elements than those arrived at graphically. On account of the probability of blends affecting the velocities of the plates, no probable error was computed for either normal places or individual plates.

Dominion Observatory
Ottawa
June, 1916.



Radial Velocity Curve of 125 Tauri